CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. Canceled.

2. Canceled.

3. (Currently Amended) A MEMS sensor for measuring stress corrosion cracking of a material of interest, comprising:

a substrate;

an electrically conductive ~~cantilever~~ beam fabricated ~~upon~~ above and spaced over the substrate, the beam having a fixed end attached to the substrate and having a free end, and the beam being made from the material of interest or an analogous material;

wherein the beam is spaced over the substrate such that the free end of the beam may move in a substantially horizontal plane parallel to the surface of the substrate;

~~at least two conductive pads fabricated on the substrate adjacent the length of the beam; and~~

~~conductive leads for electrically connecting the conductive pads to the beam~~

a pair of conductive pads, one attached to each end of the beam, for measuring the resistance along the beam.

4. (Original) The sensor of Claim 3, further comprising at least one actuator fabricated on the substrate, operable to apply stress to the beam.

5. (Original) The sensor of Claim 4, wherein the actuator moves the beam horizontally over the surface of the substrate.

6. (Currently Amended) A MEMS sensor for measuring stress corrosion cracking of a material of interest, comprising:

a substrate;

an electrically conductive cantilever beam fabricated upon the substrate, the beam having a fixed end attached to the substrate and having a free end, and the beam being made from the material of interest;

at least two conductive pads fabricated on the substrate adjacent the length of the beam; and

conductive leads for electrically connecting the conductive pads to the beam;

~~The sensor of Claim 3,~~ wherein the beam is notched to encourage cracking to occur at a predetermined location on the beam.

7. (Currently Amended) A MEMS sensor for measuring stress corrosion cracking of a material of interest, comprising:

a substrate;

an electrically conductive cantilever beam fabricated upon the substrate, the beam having a fixed end attached to the substrate and having a free end, and the beam being made from the material of interest;

at least two conductive pads fabricated on the substrate adjacent the length of the beam; and

conductive leads for electrically connecting the conductive pads to the beam;

~~The sensor of Claim 3,~~ further comprising a scale fabricated at the free end of the beam.

8. Canceled.

9. Canceled.

10. Canceled.

11. (Currently Amended) The sensor of Claim 3, wherein at least one of the conductive pads ~~are~~ is fixed to the substrate.

12. (Currently Amended) The sensor of Claim 3, wherein at least one of the conductive pads ~~are~~ is moveable across the substrate in response to movement of the beam.

13. (Original) A method of measuring stress corrosion cracking of a material of interest, comprising the steps of:

placing a MEMS sensor in an environment of interest, the MEMS sensor having a substrate, a cantilevered beam with a free end and a fixed end attached to the substrate, and having electrical connections to the beam to at least two points along the length of the beam;

wherein the beam is made from the material of interest;

applying stress to the beam;

exposing the beam to environmental corrosion; and

measuring the electrical resistance along the length of the beam.

14. (Original) The method of Claim 13, further comprising the step of notching the beam to encourage cracking to occur at a predetermined location on the beam.

15. (Original) The method of Claim 13, wherein the step of applying stress is performed such that the beam moves horizontally across the substrate.

16. (Original) The method of Claim 13, wherein the beam is divided into two arms extending from the fixed end of the beam, and wherein the step of applying stress is performed such that stress is applied to one of the arms.

17. (Original) The method of Claim 13, wherein the beam has a single arm, to which stress is applied and whose resistance is measured.

18. (Original) The method of Claim 13, wherein the step of applying stress is performed with at least one actuator integrated onto the substrate.

19. (Currently Amended) A MEMS sensor for measuring stress corrosion cracking of a material of interest, comprising:

a substrate;

~~an electrically conductive cantilever~~ a beam fabricated upon the substrate, the beam having a fixed end attached to the substrate and having a free end~~, and~~

wherein at least a portion of the length of the beam being made from the material of interest or an analogous material;

wherein at least a portion of the beam at the free end is made from or has attached to, an electrically conductive material;

wherein the beam is spaced over the substrate such that the free end of the beam may move in a substantially horizontal plane parallel to the surface of the substrate; and

a capacitance meter fabricated adjacent the free end of the beam and operable to measure the capacitance between the free end of the beam and the meter.

20. (Currently Amended) The sensor of Claim 19, wherein the beam is entirely made from the material of interest or the analogous material.

21. (Currently Amended) The sensor of Claim 19, further comprising at least one actuator fabricated on the substrate, operable to apply ~~stress~~ force to the beam in a horizontal direction.

22. (Original) A method of measuring stress corrosion cracking of a material, comprising the steps of:

placing a MEMS sensor in an environment of interest, the MEMS sensor having a substrate, a cantilevered beam with a free end and a fixed end attached to the substrate, and having an electrical connection to the beam;

wherein at least a portion of the beam is made from the material;

applying stress to the beam;

exposing the beam to environmental corrosion;

placing a capacitance meter near the free end of the beam; and

measuring the electrical capacitance between the free end of the beam and the capacitance meter.

23. (Original) The method of Claim 22, wherein the step of applying stress is performed with at least one actuator integrated onto the substrate.

24. (New). The sensor of Claim 3, wherein the beam is split lengthwise for a distance from the free end of the beam into two arms.

25. (New) The sensor of Claim 24, further comprising a second pair of conductive pads, such that the resistance along both arms of the beam may be measured.

26. (New) The sensor of Claim 3, wherein the beam is notched to encourage cracking to occur at a predetermined location on the beam.

27. (New) The sensor of Claim 3, further comprising a scale fabricated at the free end of the beam.

28. (New) The sensor of Claim 21 wherein the actuator moves the beam horizontally over the surface of the substrate.